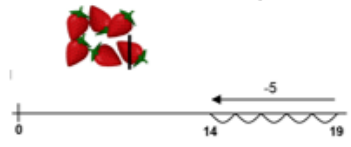
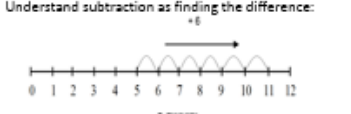

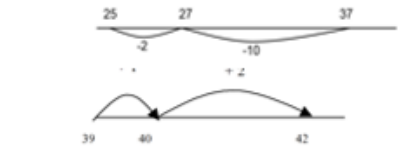

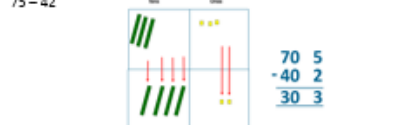
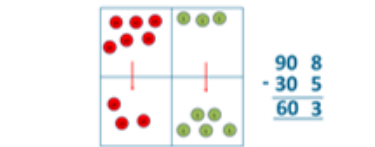

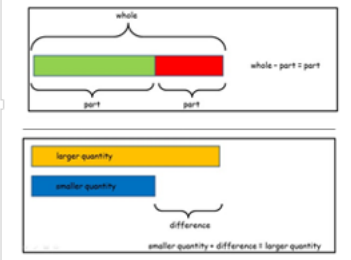
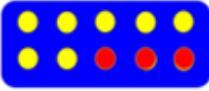

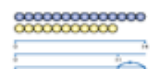

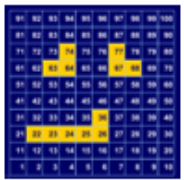




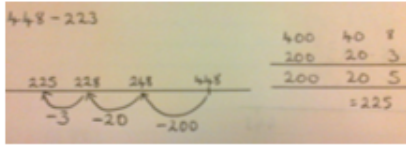
Preston Primary School Adacemy – Calculation methods

Subtraction

Obj	Gui	Year 1	Vid	Ex	Obj	Gui	Year 2	Vid	Ex	Obj	Gui	Year 3	Vid	Ex
		<p>Solve one step subtraction problems, and missing number problems.</p> <p>Missing number problems e.g. $7 = \square - 9$; $20 - \square = 9$; $15 - 9 = \square$; $\square - \square = 11$; $16 - 0 = \square$</p> <p>Use concrete objects and pictorial representations. If appropriate, progress from using number lines with every number shown to number lines with significant numbers shown.</p> <p>Subtract one digit and two-digit numbers to 20, including zero.</p> <p>Understand subtraction as take-away:</p>  <p>Understand subtraction as finding the difference:</p>   <p>The above model would be introduced with concrete objects which children can move (including cards with pictures) before progressing to pictorial representation. The use of other images is also valuable for modelling subtraction e.g. Numicon, bundles of straws, Dienes apparatus, multi-link cubes, bead strings</p>			<p>Missing number problems e.g. $52 - 8 = \square$; $\square - 20 = 25$; $22 = \square - 21$; $6 + \square + 3 = 11$</p> <p>mentally, including two two-digit numbers, and a two digit Subtract numbers number and ones and tens.</p> <p>It is valuable to use a range of representations (also see Y1). Continue to use number lines to model take-away and difference. E.g.</p>  <p>The link between the two may be supported by an image like this, with 47 being taken away from 72, leaving the difference, which is 25.</p>  <p>The bar model should continue to be used, as well as images in the context of measures.</p> <p>Use expanded column subtraction.</p> <p>Towards written methods Support understanding of the quantity aspect of place value and prepare for efficient written methods with larger numbers. The numbers may be represented with Dienes apparatus. E.g. $75 - 42$</p> 			<p>Missing number problems e.g. $\square = 43 - 27$; $145 - \square = 138$; $274 - 30 = \square$; $245 - \square = 195$; $532 - 200 = \square$; $364 - 153 = \square$</p> <p>Subtract numbers mentally including a three-digit number with ones, tens or hundreds.</p> <p>Mental methods should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving (see Y1 and Y2). Children should make choices about whether to use complementary addition or counting back, depending on the numbers involved.</p> <p>Subtract numbers with up to three digits, using column subtraction</p> <p>Written methods (progressing to 3-digits) Introduce expanded column subtraction with no decomposition, modelled with place value counters (Dienes for those who need a less abstract representation)</p>  <p>For some children this will lead to regrouping, modelled using place value counters (or Dienes).</p> 						

Year 1	Year 2	Year 3
<p>The Singapore Bar method.</p> 	<p>Continue with Singapore Bar Method.</p>	<p>A number line and expanded column method may be compared next to each other.</p> <p>Some children may begin to use a formal columnar algorithm, initially introduced alongside the expanded method. The formal method should be seen as a more streamlined version of the expanded method, not a new method.</p> <p>Continue with Singapore Bar Method.</p>

Subtraction		
Year 1	Year 2	Year 3
<p>Mental Strategies</p> <ul style="list-style-type: none"> Children should experience regular counting back from different numbers in 1s and in multiples of 2, 5 and 10. Children should memorise and reason with number bonds for numbers to 20, experiencing the = sign in different positions. They should see addition and subtraction as related operations. E.g. $7 + 3 = 10$ is related to $10 - 3 = 7$, understanding of which could be supported by an image like this.  <ul style="list-style-type: none"> Use bundles of straws and Dienes to model partitioning teen numbers into tens and ones. Children should begin to understand subtraction as both taking away and finding the difference between, and should find small differences by counting on.  <p style="text-align: center;">Subtraction as "taking away"</p>  <p style="text-align: center;">Subtraction as "the difference between"</p> <p>Vocabulary Subtraction, subtract, take away, distance between, difference between, more than, minus, less than, equals = same as, most, least, pattern, odd, even, digit.</p>	<p>Mental Strategies</p> <ul style="list-style-type: none"> Children should count back regularly, in steps of 2, 3, 5 and 10. Counting back in tens from any number should lead to subtracting multiples of 10. Number lines should continue to be an important image to support thinking, for example to model how to subtract 9 by adjusting.  <ul style="list-style-type: none"> Children should practise subtraction to 20 to become increasingly fluent. They should use the facts they know to derive others, e.g. using $10 - 7 = 3$ and $7 = 10 - 3$ to calculate $100 - 70 = 30$ and $70 = 100 - 30$.  <ul style="list-style-type: none"> As well as number lines, 100 squares could be used to model calculations such as $74 - 11$, $77 - 9$ or $36 - 14$, where partitioning or adjusting are used. On the example above, 1 is in the bottom left corner so that 'up' equates to 'add'. Children should learn to check their calculations, including by adding to check. They should continue to see subtraction as both take away and finding the difference, and should find a small difference by counting up. They should use Dienes to model partitioning into 	<p>Mental Strategies</p> <ul style="list-style-type: none"> Children should continue to count back regularly, now including multiples of 4, 8, 50, and 100, and steps of 1/10. The number line should continue to be used as an important image to support thinking, and the use of informal jottings should be encouraged. Children should continue to partition numbers in different ways. They should be encouraged to choose the mental strategies which are most efficient for the numbers involved, e.g. counting up (difference, or complementary addition) for $201 - 198$; counting back (taking away / partition into tens and ones) for $201 - 12$. Calculators can usefully be introduced to encourage fluency by using them for games such as 'zap' (e.g. Enter the number 567. Can you 'zap' the 6 digit and make the display say 507 by subtracting 1 number?) The strategy of adjusting can be taken further, e.g. subtract 100 and add one back on to subtract 99. Subtract other near multiples of 10 using this strategy. <p>Vocabulary Hundreds, tens, ones, estimate, partition, recombine, difference, decrease, near multiple of 10 and 100, inverse, rounding, column subtraction, exchange See also Y1 and Y2</p> <p>Generalisations</p> <ul style="list-style-type: none"> Noticing what happens to the digits when you count in tens and hundreds. Odd - odd = even etc (see Year 2) Inverses and related facts - develop fluency in finding related addition and subtraction facts. Develop the knowledge that the inverse relationship can be used as a checking method.

<p>Generalisations</p> <ul style="list-style-type: none"> True or false? Subtraction makes numbers smaller When introduced to the equals sign, children should see it as signifying equality. They should become used to seeing it in different positions. Children could see the image below and consider, "What can you see here?" e.g. 3 yellow, 1 red, 1 blue. $3 + 1 + 1 = 5$, 2 circles, 2 triangles, 1 square. $2 + 2 + 1 = 5$ see 2 shapes with curved lines and 3 with straight lines. $5 = 2 + 3$ $5 = 3 + 1 + 1 = 2 + 2 + 1 = 2 + 3$  <p>Some Key Questions How many more to make...? How many more is... than...? How much more is...? How many are left/left over? How many have gone? One less, two less, ten less... How many fewer is... than...? How much less is...? What can you see here? Is this true or false?</p>	<p>tens and ones and learn to partition numbers in different ways e.g. $23 = 20 + 3 = 10 + 13$.</p> <p>Vocabulary Subtraction, subtract, take away, difference, difference between, minus Tens, ones, partition Near multiple of 10, tens boundary Less than, one less, two less... ten less... one hundred less More, one more, two more... ten more... one hundred more</p> <p>Generalisation</p> <ul style="list-style-type: none"> Noticing what happens when you count back in tens (the digits in the ones column stay the same) Odd - odd = even; odd - even = odd; etc. Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems. This understanding could be supported by images such as this.  <p style="text-align: center;">$20 - 5 = 15$</p> <p>Some Key Questions How many more to make...? How many more is... than...? How much more is...? How many are left/left over? How many fewer is... than...? How much less is...? Is this true or false? If I know that $7 - 2 = 5$, what else do I know? (e.g. $70 - 20 = 50$, $700 - 200 = 500$, What do you notice? What patterns can you see?</p>	<p>Key Questions What do you notice? What patterns can you see?</p> <p>When comparing two methods alongside each other: What's the same? What's different? Look at this number in the formal method; can you see where it is in the expanded method / on the number line</p> 
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